

## LCA Education

### Environmental Courses and Studies

at the Fachhochschule Wedel, Germany

Today every business has to tackle manifold environmental issues to prepare itself for current and future market demands. Every enterprise has to integrate environmental solutions over all business functions. Environmental tasks within a company range from compliance to an ever growing number of environmental laws, the consideration of the environment in product design and manufacturing operations, and the consideration of the growing demand by European consumers for "green products" and ecological information. Every engineer and manager in a company will have to consider the environment in its day to day tasks and operations: "Eco-design", "Production-Integrated Environmental Protection", "Environmental Controlling" and "EcoAuditing" are the trigger words which will reshape the operation of the companies in the future. The universities have to prepare the students for those demands by integrating environmental questions in existing courses and offering additional environmental modules to deepen the environmental knowledge of the students.

The Fachhochschule Wedel located close to Hamburg offers environmental modules for the students of "Industrial Engineering" and "Physical Engineering". A unique post-graduate education in "Environmental Management and Engineering" for students with a degree in engineering or the natural sciences is also being offered since April 1996.

#### 1. The Basics of Clean Production:

**Module "Environmental Management and Engineering" for undergraduate students:**

This optional module within the curriculae of "Physical Engineering" and "Industrial Engineering" will introduce the basics of environmental engineering and environmental management. Within the last four terms of the studies, several lectures and seminars are offered including

**Industrial Ecology** – an introduction into the basic principles of the functions of nature and the key interactions of industry which are related

**Environmental Law** - an overview of the current environmental legislation in Europe

**Environmental Economics** – an introduction into the "hidden" costs of our production system and the potential economical tools towards a sustainable society

**Environmental Business Administration** – covers the integration of environmental management principles across all business functions

**Environmental Analytical Chemistry** – provides the basis to understand the principles of analyzing environmental chemicals and the interpretation of limiting values

**Environmental Technology – Energy** – an account of the current environmental problems associated with energy production and the potentials for change

**Solid Waste Management** – a lecture on waste avoidance and appropriate waste handling

**Eco-Auditing Seminar** – in this exercise, the students will use their skills to evaluate products and services using an environmental life-cycle approach

#### 2. Combining Professional Practice with University Environmental Management Studies: Post-Graduate Course on "Environmental Engineering/Environmental Management"

The Fachhochschule Wedel offers this post-graduate course for students or professionals with a degree in engineering or the natural sciences. The aim of this course is to further broaden the environmental knowledge of the participants within their specific technical field or function and to prepare them for environmental manager functions which are also required by law. The course lasts four semesters or two years. It is unique in the sense that it is organized in such a way that professionals can combine the university study with their job. It is also one of the few universities focusing the course of study on environmental life-cycle management. Lectures are concentrated on two afternoons during the 12-week term. In the university vacation period, students gather for additional one-week-workshops and weekend trainings.

In addition to the lectures already taught in the "environmental module" (see above), further lectures in the field of ecology, bionics, ecological chemistry, ecotoxicology, environmental marketing and the ecobalances are provided to deepen the understanding in

**Safety Assessment of products and materials – basic principles** on the process of risk assessment

**Environmental Technology** – an overview and training in the principles of clean production with a special focus on waste management, air emission abatement and water protection

**Eco-Design** – an exercise based workshop on the principles of "green" product design and Design for Recycling

**Lifecycle Management** – lectures and practical PC-training on the qualitative and quantitative tools of life-cycle assessment

**Environmental Marketing** – a training on environmental communication and marketing aspects

Major emphasis of the curriculum lies in offering courses which provide practical training in "Ecological Assessment", "Evaluation of Chemicals", "Environmental Technology" and "Life-Cycle Analysis". A training in management skills complements the curriculum. Practical seminars make up 50 % of the two-year course of studies. Excursions to several companies and participation at environmental scientific congresses are an integral part of the curriculum. The study is completed with a diploma thesis.

Graduates may take positions in the general area of environmental management but specifically will be qualified for positions in ecological product evaluation and design, R&D, environmental marketing, environmental controlling as well as the purchasing and the training departments.

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